

1           DENTAL HYGIENE DEVICE & TEETH POLISHING METHOD

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3           RELATED PATENT APPLICATIONS & INCORPORATION BY REFERENCE

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5           This application is a utility application based on U. S. provisional  
6 patent application Serial No. 60/440,134, entitled "Prophy Cup  
7 Attachment," filed January 15, 2003. This related application is  
8 incorporated herein by reference and made a part of this application. If  
9 any conflict arises between the disclosure of the invention in this  
10 utility application and that in the related provisional application, the  
11 disclosure in this utility application shall govern. Moreover, the  
12 inventor incorporates herein by reference any and all U. S. patents, U.  
13 S. patent applications, and other documents cited or referred to in this  
14 application or cited or referred to in the U. S. patents and U. S. patent  
15 applications incorporated herein by reference.

16  
17                           DEFINITIONS

18  
19           The words "comprising," "having," "containing," and "including,"  
20 and other forms thereof, are intended to be equivalent in meaning and  
21 be open ended in that an item or items following any one of these  
22 words is not meant to be an exhaustive listing of such item or items, or  
23 meant to be limited to only the listed item or items.

24  
25                           BACKGROUND OF INVENTION

26  
27           Polishing teeth is a common dental procedure wherein a  
28 polishing material is applied to a patient's teeth using an implement  
29 attached to the handpiece of a dental drill. The polishing implement,

1 commonly referred to as a prophy angle, is periodically tipped into a  
2 container of polishing material to collect on the tip of the implement  
3 some of this material. The tip of the implement with the material  
4 thereon is then brought to bear against a tooth of the patient.

## 6 SUMMARY OF INVENTION

8 This invention has one or more features as discussed  
9 subsequently herein. After reading the following section entitled  
10 "DETAILED DESCRIPTION OF ONE EMBODIMENT OF THIS INVENTION,"  
11 one will understand how the features of this invention provide its  
12 benefits. The benefits of this invention include, but are not limited to:  
13 convenience of use, improved ergonomics for the user polishing teeth,  
14 reduction of saliva flow for a drier working environment, improved  
15 patient comfort, more effective use of polishing material, reduction in  
16 the time to polish teeth, low cost, and disposability.

17 Briefly, this invention comprises a cup member that holds the  
18 polishing material and an attachment member such as a clip  
19 incorporated into the cup member that attaches to a suction tube,  
20 commonly referred to as a saliva ejector in a dental operatory. The  
21 suction tube is placed in the patient's mouth at the time of polishing.

22 This invention saves time, decreases frustration of the user,  
23 typically a dental hygienist, and helps keep an ideal dry environment  
24 for the user while providing the service of polishing the patient's teeth.  
25 While the user polishes the patient's teeth excess saliva can be  
26 produced which can decrease the effect of the polish and increase  
27 patient discomfort caused by pooling saliva in the patient's mouth (it is  
28 best to polish in an dry environment so the polishing material can  
29 effectively remove soft plaque etc. and clean the tooth surface). When

1 employing the conventional polishing method, the user has to stop  
2 several times to suction out the saliva to keep the mouth dry and the  
3 patient comfortable. That means stopping the polishing procedure,  
4 putting down the polishing implement and the container of the  
5 polishing material, and picking up and placing the suction tube in the  
6 patient's mouth to remove the pooling saliva. This takes up time as well  
7 as gets messy for the patient and the user. This invention avoids  
8 stopping polishing in order to apply suction to keep the mouth dry.  
9 This enables the user to access to the polishing material while allowing  
10 suction to be used continuously so the mouth can stay dry, the patient  
11 can remain comfortable, and allows the user to save time and not be  
12 inconvenienced.

13 Without limiting the scope of this invention as expressed by the  
14 claims that follow, some, but not necessarily all, of its features are:

15 One, the dental hygiene device of this invention includes a cup  
16 member with a compartment holding a tooth polishing material and an  
17 attachment member that enables the device to be attached and  
18 detached to a suction tube adapted to be inserted into the mouth of a  
19 patient during polishing of the patient's teeth. The compartment may  
20 hold a sufficient amount of polishing material to polish the teeth of  
21 essentially only a single patient. The device may be molded from a  
22 plastic. The cup member has an open top covered with a removable  
23 seal and a closed bottom. The attachment member may project  
24 outwardly from the closed bottom.

25 Two, the attachment member may comprise a pair of finger  
26 elements of sufficient length and spaced apart a predetermined  
27 distance so that, upon inserting the tube between the finger elements,  
28 the device is held securely to the tube during polishing of the patient's  
29 teeth. The finger elements may be centrally located, are substantially

1 parallel, and are substantially parallel to a longitudinal axis of the cup  
2 member. The finger elements may merge at a base member connected  
3 to the bottom and form an open bite having a substantially circular  
4 configuration having a diameter slightly less than a diameter of the  
5 suction tube. The finger elements may have inner edges tapering  
6 outward from the open bite to terminate at ends spaced apart a  
7 distance slightly greater than the diameter of the suction tube.

8 These features are not listed in any rank order nor is this list  
9 intended to be exhaustive.

10 This invention also includes a method polishing teeth. In  
11 accordance with the method of this invention a suction tube is placed  
12 into an open mouth of a patient, this tube having a dental hygiene  
13 device mounted on the tube nearby the open mouth and the dental  
14 hygiene device holds a tooth polishing material that is accessed  
15 periodically during polishing of the patient's teeth.

#### 16 17 DESCRIPTION OF DRAWING 18

19 One embodiment of this invention, illustrating all its features, will  
20 now be discussed in detail. This embodiment depicts the novel and  
21 non-obvious dental hygiene device and teeth polishing method of this  
22 invention as shown in the accompanying drawing, which is for  
23 illustrative purposes only. This drawing includes the following figures  
24 (Figs.), with like numerals indicating like parts:

25  
26 Fig. 1 is a side elevational view of one embodiment of the dental  
27 hygiene device of this invention.

28 Fig. 1A is a cross-sectional view taken along line 1A-1A of Fig. 1.

29 Fig. 2 is a front elevational view of the dental hygiene device of

1 this invention taken along line 2-2 of Fig. 1.

2 Fig. 3 is a cross-sectional view taken along line 3-3 of Fig. 2.

3 Fig. 4 is a perspective view illustrating using the one embodiment  
4 of the dental hygiene device of this invention shown in Figs. 1 through  
5 3.

6 Fig. 5 is a cross-sectional view taken along line 5-5 of Fig. 4.

7  
8 DETAILED DESCRIPTION OF ONE EMBODIMENT OF THIS INVENTION  
9

10 As depicted in Figs. 1 through 3, one embodiment of this  
11 invention, the dental hygiene device 10, includes a cup member 12  
12 having an attachment member 14 that enables the device to be  
13 attached and detached to a suction tube 16 (Fig. 4). This suction tube  
14 16, the saliva ejector, is adapted to be inserted into the mouth M (Fig.  
15 4) of a patient during polishing of the patient's teeth T. The cup  
16 member 12 holds within an internal compartment 13 (Fig. 1A) a tooth  
17 polishing material 18 such as, for example, Nupro® prophylaxis paste  
18 manufactured by DENTSPLY Preventive Care of York Pennsylvania. This  
19 polishing material 18 is a moist paste comprising an abrasive material  
20 including solid particulates. The device 10 may be molded from a  
21 plastic such as, for example polypropylene, to form a unitary structure  
22 with the cup member 12 and the attachment member 14 integrated as  
23 a single piece.

24 The compartment 13 is filled with a sufficient amount of  
25 polishing material 18 to polish the teeth T of essentially only a single  
26 patient. For example, in the embodiment illustrated the compartment  
27 13 has the capacity to hold from about 0.05 to about 0.1 cubic inches  
28 of the tooth polishing material 18. This compartment 13 has an open  
29 top 13a, a substantially cylindrical side wall 13b, and a closed bottom

1 13c. The open top 13a has a substantially circular configuration and is  
2 at least partially encompassed by a rim 20 that projects outwardly  
3 from a side wall 13b of the cup member 12 at an angle of about  
4 90° with respect to the longitudinal axis X of the cup member 12. A  
5 removable seal 22, shown partially removed, covers and seals the open  
6 top 13a and prevent access to the polishing material 18 until the user  
7 is ready to polish a patient's teeth. This seal may be a thin foil material  
8 with an adhesive 24 (Fig. 2) between the rim and perimeter of the seal  
9 fixing the seal 20 to the rim 20 until removed.

10 The attachment member 14 projects outwardly from the bottom  
11 wall 13c of the cup member 12 and it may be in the form of a clip  
12 configured to grasp the suction tube 16. The attachment member 14  
13 may comprise a pair of fingers 14a and 14b. The fingers 14a and 14b  
14 are of sufficient length and spaced apart a predetermined distance so  
15 that upon inserting the suction tube 16 (Fig. 5) between the fingers the  
16 device 10 is held securely to the tube during polishing of the patient's  
17 teeth with the fingers straddling and grasping the tube. The fingers 14a  
18 and 14b are centrally located, are substantially parallel, and are  
19 substantially parallel to the longitudinal axis X of the cup member 12.  
20 These finger elements 14a and 14b merge at a base member 26  
21 connected to the bottom wall 13c and form an open bite 28 (Fig. 1)  
22 having a substantially circular configuration having a diameter slightly  
23 less than the diameter of the suction tube 16, for example, the  
24 diameter of the open bite 28 may be substantially about 0.25 inch.  
25 The fingers 14a and 14b each have inner edges E1 and E2 tapering  
26 outward from the open bite 28 to terminate at ends A and B spaced  
27 apart a distance slightly greater than the diameter of the suction tube  
28 16. The inner edges each tapers outward from the bottom wall 13c at  
29 an angle from about 1 to about 10° with respect to the longitudinal

1 axis X of the cup member 12.

2 In accordance with the teeth polishing method of this invention  
3 the device 10 is attached to the suction tube 16 and then detached and  
4 disposed of after using. As best illustrated in Fig. 5, an end 16a of a  
5 suction tube 16 is placed into an open mouth M of a patient with an  
6 adjacent portion 16b of the tube extending from the open mouth. With  
7 the device 10 mounted on the adjacent portion 16b of the tube 16 by  
8 the attachment member 14, the cup member 12 is positioned on the  
9 tube 16 to enable access to the tooth polishing material 18 during  
10 polishing of the patient's teeth. A conventional disposable polishing  
11 implement 30 connected to a conventional dental handpiece 32 of a  
12 dental drill (not shown) is used to apply the polishing material 18 from  
13 the cup member 12 to the teeth T. A suitable polishing implement 30  
14 is sold by DENTSPLY Preventive Care of York Pennsylvania identified as  
15 the prophy angle bearing the trademark Rite-Angle®. The patient's  
16 teeth T are polished while suction is concurrently being applied  
17 through the suction tube 16 to withdraw saliva from the patient's  
18 mouth. The polishing implement 30 is periodically inserted by the  
19 user into the tooth polishing material 18 to collect on the implement a  
20 portion of the material in the cup member 12. When all the patient's  
21 teeth are polished, the compartment 13 is essentially depleted of all  
22 the polishing material 18 and the device 10 is detached from the tube  
23 16 and discarded.

## 24 25 SCOPE OF THE INVENTION 26

27 The above presents a description of the best mode contemplated  
28 of carrying out the present invention, and of the manner and process  
29 of making and using it, in such full, clear, concise, and exact terms as

1 to enable any person skilled in the art to which it pertains to make and  
2 use this invention. This invention is, however, susceptible to  
3 modifications and alternate constructions from that discussed above  
4 which are fully equivalent. Consequently, it is not the intention to  
5 limit this invention to the particular embodiment disclosed. On the  
6 contrary, the intention is to cover all modifications and alternate  
7 constructions coming within the spirit and scope of the invention as  
8 generally expressed by the following claims, which particularly point  
9 out and distinctly claim the subject matter of the invention: